5. Michael and his team are making toys to give to children at a summer fair. They make two types of toy, a soft toy and a craft set.

Let x be the number of soft toys they make and y be the number of craft sets they make.

Each soft toy costs £3 to make and each craft set costs £5 to make.

Michael and his team have a budget of £1000 to spend on making the toys for the summer fair.

(a) Write down an inequality, in terms of x and y, to model this constraint.

(1)

Two further constraints are:

$$y \leqslant 2x$$

$$4y - x \geqslant 210$$

(b) Add lines and shading to Diagram 1 in the answer book to represent all of these constraints.
Hence determine the feasible region and label it R.

(4)

Michael's objective is to make as many toys as possible.

(c) State the objective.

(1)

(d) Determine the exact coordinates of each of the vertices of the feasible region, and hence use the vertex method to find the optimal number of soft toys and craft sets Michael and his team should make. You should make your method clear.

(7)

(Total for Question 5 is 13 marks)